

WHAT IS CLAIMED IS:

1. A height adjustable bed comprising:
 - a bed frame including a head portion and a foot portion;
 - a first articulated support pivotably connected to the head portion of the bed frame,
 - and a second articulated support pivotably connected to the foot portion of the bed frame, the first and second articulated supports each comprising an upper support joined articulatedly to a lower support;
 - a first sliding hinge and a second sliding hinge each comprising at least one arcuate slot and at least one pin retained in the slot, the at least one pin of each of the first sliding hinge and the second sliding hinge being connected to the lower supports of the first articulated support and the second articulated support, respectively, such that the at least one pin is capable of translating and pivoting;
 - a first wheeled base connected to the lower support of the first articulated support by the first sliding hinge;
 - a second wheeled base connected to the lower support of the second articulated support by the second sliding hinge;
 - a linkage member pivotably connected on one end to the first articulated support and on the other end to the second articulated support;
 - a linear actuator having a first end and a second end, pivotably connected on the first end to the linkage member, the linear actuator being capable of extension and retraction; and
 - an actuating frame pivotably connected to the second end of the linear actuator and pivotably connected to the first articulated support at a first fulcrum point and the second articulated support at a second fulcrum point, wherein extension and retraction of the linear actuator raises and lowers the bed frame and during raising and lowering the at least one pin of each of the first sliding hinge and the second sliding hinge in one range of intermediate positions, is translating and in another range of intermediate positions, is not translating.
2. The height adjustable bed of claim 1, wherein the first articulated support and the second articulated support are identical.

3. The height adjustable bed of claim 1, wherein the linear actuator is removably connected.

4. The height adjustable bed of claim 1, further comprising at least one linear arm pivotably connected at one end to the actuating frame and at an opposite end to the upper support, wherein the upper support is pivoted in relation to the actuating frame as the linear actuator extends or retracts.

5. The height adjustable bed of claim 1, wherein each sliding hinge further comprises a first plate and a second plate, each of the first plate and the second plate having a first arcuate slot for retaining a first pin connecting each sliding hinge to a respective lower support of one of the first articulated support and the second articulated support, the second plate having a second arcuate slot for retaining a second pin, the second arcuate slot comprising an open end and a closed end opposite of the open end, the first plate, the second plate, the first pin and the second pin being configured such that the first pin in the first arcuate slot translates in one range of intermediate positions, and the second pin in the second arcuate slot translates in a circular arc around the first pin in another range of intermediate positions, when the first pin is stationary.

6. A height and angle adjustable bed comprising:

a bed frame including at least one longitudinal framing member, a first transverse framing member at a head portion of the bed frame and a second transverse framing member at a foot portion of the bed frame;

a first articulated support pivotably connected to the head portion of the bed frame, and a second articulated support pivotably connected to the foot portion of the bed frame, the first and second articulated supports each comprising an upper support joined articulatedly to a lower support;

a first sliding hinge and a second sliding hinge each comprising an arcuate slot and at least one pin retained in the slot, the at least one pin of each of the first sliding hinge and the second sliding hinge being connected to the lower supports of the first articulated support and

the second articulated support, respectively, such that the at least one pin is capable of translating and pivoting;

a first wheeled base connected to the first articulated support by the first sliding hinge;

a second wheeled base connected to the second articulated support by the second sliding hinge;

a linkage member pivotably connected on one end to the first articulated support and on the other end to the second articulated support;

a linear actuator having a first end and a second end, pivotably connected on the first end to the linkage member, the linear actuator being capable of extension and retraction;

an actuating frame pivotably connected to the second end of the linear actuator and pivotably connected to the first articulated support at a first fulcrum point and the second articulated support at a second fulcrum point, such that extension and retraction of the linear actuator raises and lowers the bed frame and such that during raising and lowering of bed frame the at least one pin of each of the first sliding hinge and the second sliding hinge, in one range of intermediate positions, is translating and, in another range of intermediate positions, is not translating; and

an articulated mattress frame supported by the bed frame, the articulated mattress frame including a head assembly, a foot assembly and a central assembly, the central assembly attaching the head assembly to the foot assembly articulatedly, wherein the articulated mattress frame is supported by the bed frame.

7. The height and angle adjustable bed of claim 6, further comprising a colinear actuator having a central portion, a first end and a second end opposite of the first end of the colinear actuator, wherein the central portion of the colinear actuator is attached to the bed frame, the first end is pivotably attached to the head assembly and the opposite end is pivotably attached to the foot assembly.

8. The height and angle adjustable bed of claim 6, further comprising a first adjunct linear actuator and a second adjunct linear actuator, each having a first end and an opposite end, wherein the first end of each adjunct linear actuator is connected to the bed frame and

the second end of the first adjunct linear actuator is pivotably attached to the head assembly and the second end of the second adjunct linear actuator is pivotably attached to the central assembly.

9. The height and angle adjustable bed of claim 8, further comprising a first bracket fixedly attached to the head assembly and a second bracket fixedly attached to the foot assembly, wherein the first bracket functions as an attachment point for the first adjunct linear actuator for adjusting the angle of the head assembly in relation to the central assembly, and the second bracket functions as an attachment point for the second adjunct linear actuator.

10. The height and angle adjustable bed of claim 9, wherein the foot assembly comprises a lower mattress support articulately joined to a middle mattress support that is pivotably attached to the central assembly and the second bracket is fixed to the middle mattress support such that the second adjunct linear actuator is capable of adjusting the angle of the middle mattress support in relation to both the central assembly and the lower mattress support.

11. A height adjustable bed comprising:
a bed frame including a head portion and a foot portion;
a first articulated support pivotably connected to the head portion of the bed frame,
and a second articulated support pivotably connected to the foot portion of the bed frame, the first and second articulated supports each comprising an upper support joined articulately to a lower support;
a first sliding hinge and a second sliding hinge;
a first wheeled base connected to the lower support of the first articulated support by the first sliding hinge;
a second wheeled base connected to the lower support of the second articulated support by the second sliding hinge;
a linkage member pivotably connected on one end to the first articulated support and on the other end to the second articulated support;

a linear actuator having a first end and a second end, pivotably connected on the first end to the horizontal linkage member, the linear actuator being capable of extension and retraction; and

an actuating frame pivotably connected to the second end of the linear actuator and pivotably connected to the first articulated support and the second articulated support;

wherein extension and retraction of the linear actuator raises and lowers the bed frame and during raising of the bed frame from a low position to a high position the bed reaches a transition point and forces acting downward on the first articulated support and the second articulated support are applied to the first sliding hinge and the second sliding hinge, when the bed is raised above the transition point, and as the bed is lowered from the high position, the actuating frame contacts the first wheeled base and the second wheeled base when the bed reaches the transition point and the forces acting downward are shifted away from the first sliding hinge and the second sliding hinge to the actuating frame when the bed is below the transition point.

12. The bed of claim 11, wherein the forces acting downward are shifted from the first sliding hinge to the first fulcrum point and from the second sliding hinge to the second fulcrum point, when the bed is lowered below the transition point, whereby a mechanical advantage is obtained.

13. The bed of claim 11, further comprising a third sliding hinge attached at an opposite side of the first wheeled base from the first sliding hinge and a fourth sliding hinge attached at an opposite side of the second wheeled base from the second sliding hinge.

14. The bed of claim 11, further comprising a stabilizing device, wherein the stabilizing device connects the actuating frame to one of the first wheeled base and the second wheeled base such that the bed is stabilized above the transition point.

15. The bed of claim 14, wherein the first sliding hinge and the second sliding hinge each comprises:

a first plate and a second plate, each plate having a first arcuate slot for retaining a first pin, each first pin connecting the first sliding hinge and the second sliding hinge to the lower support of the first articulated support and the second articulated support, respectively; and

the second plate including a second arcuate slot for retaining a second pin, each second pin connecting the first sliding hinge and the second sliding hinge to the lower support of the first articulated support and the second articulated support, respectively,

the first plate and the second plate of each sliding hinge being configured such that the first pin translates in the first arcuate slot during raising and lowering of the bed below the transition point, and the second pin translates in the second arcuate slot in a circular arc around the first pin during raising and lowering of the bed above the transition point, whereby the second plate acts as the stabilizing device.

16. The bed of claim 14, wherein the stabilizing device comprises a guiding link connecting a first pivot point connected to the actuating frame and a second pivot point connected to the first wheeled base.

17. The bed of claim 16, wherein each of the first sliding hinge comprises at least one plate and the at least one plate retains a pin, the pin connecting the first sliding hinge to the lower support of the first articulated support, the first pivot point and the second pivot point of the guiding link being positioned such that, above the transition point, an imaginary line drawn from a center of rotation of the first pivot point to a center of rotation of the second pivot point is parallel to a second imaginary line drawn from a center of rotation of the pin and a center of rotation of the first fulcrum point.

18. A height adjustable bed comprising:

a bed frame including at least one longitudinal framing member, a first transverse framing member at a head portion of the bed frame and a second transverse member at a foot portion of the bed frame;

a first articulated support pivotably connected to the head portion of the bed frame and including a first upper support articulately joined to a first lower support, the first lower

support comprising a first support leg and a second support leg, the second support leg of the first lower support being attached to the first support leg of the first lower support by a first cross member;

a second articulated support pivotably connected to the foot portion of the bed frame and including a second upper support articulately joined to a second lower support, the second lower support comprising a first support leg and a second support leg, the second support leg of the second lower support being attached to the first support leg of the second lower support by a second cross member;

a first castor base connected to the first support leg of the first lower support by a first sliding hinge and to the second support leg of the first lower support by a second sliding hinge, the first castor base comprising at least two castor wheels connected by a castor base frame;

a second castor base connected to the first support leg of the second lower support by a third sliding hinge and to the second support leg of the second lower support by a fourth sliding hinge, the second castor base comprising at least two castor wheels connected by a castor base frame;

an actuating frame comprising a left longitudinal member and a right longitudinal member connected to the left longitudinal member by at least one transverse member, the left longitudinal member being pivotably connected to the first support leg of the first lower support and to the first support leg of the second lower support, the right longitudinal member being pivotably connected to the second support leg of the first lower support and the second support leg of the second lower support;

a linear actuator having a first end and a second end, being pivotably connected at the first end to a linkage member that is pivotably connected on one end to the first articulated support and on another end to the second articulated support, and the linear actuator being pivotably connected at the second end to one of the at least one transverse member of the actuating frame such that extension and retraction of the linear actuator raises and lowers the bed; and

wherein during raising of the bed frame from a low position to a high position the bed reaches a transition point and forces acting downward on the first articulated support and the second articulated support are applied to the first sliding hinge, the second sliding hinge, the

third sliding hinge and the fourth sliding hinge, when the bed is raised above the transition point, and as the bed is lowered from the high position, the actuating frame contacts the first castor base and the second castor base when the bed reaches the transition point and the forces acting downward are shifted away from the first sliding hinge, the second sliding hinge, the third sliding hinge and the fourth sliding hinge to the actuating frame when the bed is below the transition point.